

WHAT IS CLAIMED IS

1. A method for fabricating a capacitor comprising the steps of:

forming a lower electrode of a metal over a substrate;

forming a capacitor dielectric film of an oxide dielectric film on the lower electrode;

depositing a metal film on the capacitor dielectric film;

performing a thermal processing in a hydrogen-content atmosphere after the step of depositing the metal film; and

patterning the metal film to form an upper electrode of the metal film after the step of performing the thermal processing.

2. A method for fabricating a capacitor comprising the steps of:

forming a lower electrode of a metal over a substrate;

forming a capacitor dielectric film of an oxide dielectric film on the lower electrode; and

forming an upper electrode of a metal on the capacitor dielectric film,

conditions for forming the lower electrode and the upper electrode being controlled so that an oxygen concentration in the upper electrode is higher than that in the lower electrode.

3. A method for fabricating a capacitor according to claim 1, wherein the step of forming the upper electrode comprises the steps of:

depositing a metal film;

subjecting the metal film to a thermal processing in a hydrogen-content atmosphere; and

patterning the metal film to form the upper electrode of the metal film.

4. A method for fabricating a semiconductor device comprising the steps of:

forming a lower electrode of a metal over a semiconductor substrate;

forming a capacitor dielectric film of an oxide dielectric film on the lower electrode;

depositing a metal film on the capacitor dielectric film;

performing a thermal processing in a hydrogen-content atmosphere after the step of depositing the metal film; and

patterning the metal film to form an upper electrode of the metal film after the step of performing the thermal processing.

5. A method for fabricating a semiconductor device comprising the steps of:

forming a lower electrode of a metal over a semiconductor substrate;

forming a capacitor dielectric film of an oxide dielectric film on the lower electrode;

forming an upper electrode of a metal on the capacitor dielectric film;

performing a thermal processing in a hydrogen-content atmosphere after the step of forming the upper electrode; and

forming an uppermost passivation film over the upper electrode after the step of performing the thermal processing.

6. A method for fabricating a semiconductor device according to claim 5, further comprising the step of:

performing a thermal processing in a nitrogen atmosphere after the step of performing the thermal processing in a hydrogen-content atmosphere.

7. A method for fabricating a semiconductor device according to claim 4, wherein

conditions for forming the lower electrode and the upper electrodes are controlled so that an oxygen concentration of the upper electrode is higher than that of the lower electrode.

8. A method for fabricating a semiconductor device according to claim 5, wherein

conditions for forming the lower electrode and the upper electrodes are controlled so that an oxygen concentration of the upper electrode is higher than that of the lower electrode.

9. A method for fabricating a semiconductor device according to claim 6, wherein

conditions for forming the lower electrode and the upper electrodes are controlled so that an oxygen concentration of the upper electrode is higher than that of the lower electrode.